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ABSTRACT:

PURPOSE: To eliminate the slacking and tension of a transfer material and to prevent the elongation of an image and the scattering of toner by eliminating the carrying speed difference between a transfer drum and a fixing unit with respect to the transfer material.

CONSTITUTION: The carrying speed V0 of the transfer material by the transfer drum 6 is obtained by the length of the transfer material, the speed of revolutions of the transfer drum 6, etc., and the carrying speed V1 of the transfer material by the fixing unit 8 is obtained by the length of the

transfer material and the time of the passage of the transfer material on a
paper ejection sensor 34 on the downstream side of the fixing unit 8. When a
difference dV(=V0-V1) is made between both carrying speeds by the wearing of a
fixing roller 8a, etc., a transfer material is slacked or tensed when the
transfer paper is simultaneously carried by both of the transfer drum 6 and the
fixing unit 8. The rotation of a motor 6A or 8A is controlled by a CPU 50 to
eliminate the speed difference dV.

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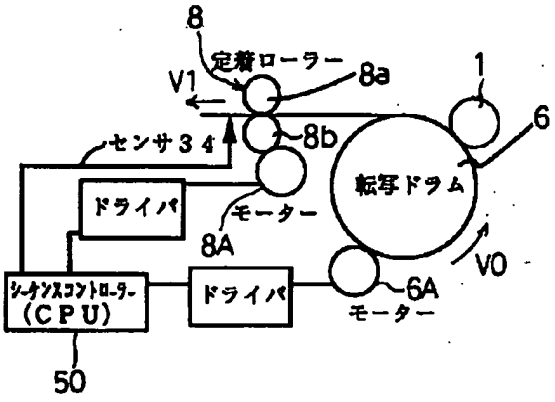
(54)【発明の名称】　画像形成装置

(57)【要約】

【目的】転写材に対する転写ドラムと定着器との搬送速度差をなくして、転写材の弛みや引っ張りをなくし、画像の伸びやトナーの飛び散りを防止する。

【構成】転写材の長さと転写ドラム６の回転数等によって、転写ドラム６による転写材の搬送速度Ｖ０を求める。転写材の長さと、定着器８下流の排紙センサ３４上を転写材が通過する時間とによって、定着器８による転写材の搬送速度Ｖ１を求める。定着ローラ８ａの摩耗等によって、両搬送速度に差ｄＶ（＝Ｖ０－Ｖ１）が生じると、転写ドラム６と定着器８とで同時に１枚の転写材を搬送したときに、この転写材に弛みや引っ張りが生じる。ＣＰＵ５０によって、モータ６Ａまたはモータ８Ａの回転を制御し、速度差ｄＶをなくす。



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【特許請求の範囲】

【請求項１】　表面にトナー像が形成される像担持体と、表面に担持した転写材に前記トナー像が転写される転写ドラムと、該転写ドラムから分離された転写材を挟持搬送しつつ該転写材上のトナー像を定着する定着装置とを備える画像形成装置において、

前記転写ドラムを駆動する第１の駆動手段と、

前記定着器を駆動する第２の駆動手段と、

これら第１、第２の駆動手段をそれぞれ個別に制御して、前記転写ドラムによる転写材の搬送速度と、前記定着器による転写材の搬送速度とを個別に変更する制御手段と、

前記定着器による転写材の搬送速度を検知する速度検知手段とを備え、

前記制御手段は、前記速度検知手段の出力に基づき、前記第１、第２の駆動手段のうち少なくとも一方を制御して、前記転写ドラムによる転写材の搬送速度と、前記定着器による転写材の搬送速度とを一致させる、

ことを特徴とする画像形成装置。

【請求項２】　前記転写材の搬送方向の長さを検知する長さ検知手段と、

前記転写ドラムによる前記転写材の搬送時間を検出する搬送時間検知手段と、

前記定着器による前記転写材の搬送時間を検知する搬送時間検知手段とを有し、

前記制御手段は、これら２つの搬送時間と、前記転写材の長さとに基づき、前記転写ドラムによる転写材の搬送速度と前記定着器による転写材の搬送速度を算出する、

ことを特徴とする請求項１記載の画像形成装置。

【発明の詳細な説明】

【０００１】

【産業上の利用分野】本発明は、複写機、レーザビームプリンタ等の画像形成装置に係り、詳しくは、画像形成装置本体の内部で転写材の搬送速度を変更するようにした画像形成装置の関する。

【０００２】

【従来の技術】図７に、画像形成装置の一例として電子写真方式のカラーレーザビームプリンタの概略構成を示す。以下、その構成と動作とを簡単に説明する。

【０００３】レーザビームプリンタ本体（以下「装置本体」という。）のほぼ中央には、感光ドラム（像担持体）１が回転自在に配置されている。感光ドラム１は、矢印Ｒ１方向の所定の速度で回転駆動され、その表面が帯電器２によって所定の極性、所定の電位に一様に帯電される。

【０００４】次に、転写材Ｐが給紙カセット１０から給紙ローラ９により所定のタイミングで１枚ずつ給紙される。そして、転写材Ｐの先端が検出器３により検出されると、画像信号により変調されたレーザ光が半導体レーザ１９からポリゴンミラー２１に向けて照射され、レーザ光はポリゴンミラー２１により走査された後、レンズ及びミラーを経て、感光ドラム１上に導かれ、感光ドラム１上を露光して第１静電潜像を形成する。この第１静電潜像は、回転式の現像装置５の現像器４ａによりトナーが付着されて現像され、感光ドラム１上にマゼンタ色の第１トナー像が形成される。

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【０００５】転写ドラム６は、所定のタイミングで給紙された転写材Ｐの先端をグリッパ１４によって把持し、吸着高圧帯電器２２によって転写材Ｐ全体を巻き付くように吸着した状態で担持する。転写ドラム６には、トナーと反対極性の転写バイアス電圧が印加され、これにより感光ドラム１上の第１トナー像が転写材Ｐ上に転写される。

【０００６】第１トナー像が転写された転写ドラム６上の転写材Ｐに対して、順次、第２、第３、第４トナー像が転写される。第１トナー像の転写が終了した感光ドラム１は、クリーナによって清掃された後、帯電器２によって再び帯電され、レーザ光の走査を受けて、表面に第２静電潜像が形成される。この第２静電潜像は、現像装置５の回転によって、現像位置に切り換え配置された現像器４ｂによって現像され、シアンのトナー像となる。このシアンのトナー像は、転写ドラム６上の転写材Ｐに転写される。同様にして感光ドラム１上に第３静電潜像が形成され、現像器４ｃによりイエローのトナー像として現像された後、転写材Ｐ上に転写される。次いで第４静電潜像が形成され、現像器４ｄにてブラックのトナー像として現像され、転写材Ｐ上に転写される。こうして、転写材Ｐ上には、４色のトナー像が重なって転写される。

【０００７】トナー像の転写が終了した転写材Ｐは、先端部が分離爪１６の位置に近づくと、分離爪１６が転写ドラム６の表面に接触して、転写材Ｐを転写ドラム６から分離させる。分離爪１６は転写材Ｐの後端が転写ドラム６から離れると元の位置に戻る。その際、帯電器１５により転写材Ｐ上の蓄積電荷が除電され、分離爪１６による転写材Ｐの分離を容易にするとともに、分離時に気中放電を減少させる。

【０００８】転写ドラム６から分離された転写材Ｐは、定着器８に進入する。定着器８は、定着ローラ８ａと、これに下方から圧接された加圧ローラ８ｂとを有し、定着ローラ８ａは内部からハロゲンヒータにより加熱されている。転写材Ｐは、定着ローラ８ａを通過する際に、表面の未定着トナー像が溶融固着されて定着される。トナー像が定着された転写材Ｐは、その後装置本体外部の排紙トレイ１８上に排出される。なお、同図中、１１は転写ドラム６上の不要な電荷を除去する除電ローラであり、２３は転写ドラム６表面を清掃するクリーニング機構である。

【０００９】上述の構成のレーザビームプリンタでは、はじめ給紙カセット１０から供給され、最後に排紙トレ

イ１８上に排出される転写材は、装置本体内部においては、通常、搬送速度は一定に設定されている。

【００１０】また定着器８はトナー像の定着性をよくするために以下のごとき手段を講じている：第１に上下に配置した定着ローラ８ａ、加圧ローラ８ｂの２本のローラで間を通過する転写材Ｐに対して高い圧力をかけ、定着性を向上させている。第２として定着ローラ８ａ表面に付着しがちなオフセットトナーを排除するためにウェブ３０に設けている。ウェブ３０は帯状のシートで、ウェブ供給ローラ３１に巻かれており少しずつウェブ巻取りローラ３３に巻取られながらウェブローラ３２に押圧されて定着ローラ８ａ表面をクリーニングしている。定着ローラ８ａの所定回転量に応じて、巻取りローラ３３の巻取り量を制御して定着ローラ８ａ上のクリーニングを良好に行っている。

【００１１】

【発明が解決しようとする課題】しかしながら、上述の従来例によると、定着性能向上のため上述手段を講じたことにより以下のような問題点が発生している。

【００１２】第１に、定着ローラ８ａ、加圧ローラ８ｂ間の圧力を高くしているためにこれらローラに変形が発生する。第２に、定着ローラ８ａ表面のクリーニングにより定着ローラ８ａ表面が削られてしまいローラ径が変化してしまう。このようにローラ変形やローラ径の変化が生じると、定着ローラ８ａの回転数（回転速度）が一定であったとしても、その周速度が変化してしまい、したがって、転写材Ｐの搬送速度が変化してしまう。

【００１３】定着器８による転写材Ｐの搬送速度が変化することにより、その上流側（転写材の搬送方向についての）に配置された転写ドラム６の周速度との間に速度差が発生してしまう。転写材Ｐは、先端側が定着器８に挟持搬送され、同時に後端側が転写材に担持されることがあり、この場合、上述の速度差によって、転写材Ｐに弛みや引っ張りが生じる。転写中の転写材Ｐが引っ張られると、画像の伸びやこすれが起こったり、また転写材Ｐの後端部が転写ドラム６から分離する際に跳ね上がって、定着前のトナーが飛び散ったりするなど画像劣化の要因となっていた。

【００１４】そこで、本発明は、上述問題を解決すべく、転写材の搬送速度差をなくし、画像の伸びやこすれ、トナーの飛び散り等の画像劣化を防止するようにした画像形成装置を提供することを目的とするものである。

【００１５】

【課題を解決するための手段】本発明は、上述事情に鑑みてなされたものであって、表面にトナー像が形成される像担持体と、表面に担持した転写材に前記トナー像が転写される転写ドラムと、該転写ドラムから分離された転写材を挟持搬送しつつ該転写材上のトナー像を定着する定着装置とを備える画像形成装置において、前記転写ドラムを駆動する第１の駆動手段と、前記定着器を駆動する第２の駆動手段と、これら第１、第２の駆動手段をそれぞれ個別に制御して、前記転写ドラムによる転写材の搬送速度と、前記定着器による転写材の搬送速度とを個別に変更する制御手段と、前記定着器による転写材の搬送速度を検知する速度検知手段とを備え、前記制御手段は、前記速度検知手段の出力に基づき、前記第１、第２の駆動手段のうち少なくとも一方を制御して、前記転写ドラムによる転写材の搬送速度と、前記定着器による転写材の搬送速度とを一致させることを特徴とする。

【００１６】この場合、前記転写材の搬送方向の長さを検知する長さ検知手段と、前記転写ドラムによる前記転写材の搬送時間を検出する搬送時間検知手段と、前記定着器による前記転写材の搬送時間を検知する搬送時間検知手段とを有し、前記制御手段は、これら２つの搬送時間と、前記転写材の長さとに基づき、前記転写ドラムによる転写材の搬送速度と前記定着器による転写材の搬送速度を算出するようにしてもよい。

【００１７】

【作用】以上構成に基づき、例えば転写材が、転写ドラムと定着器とによって同時に搬送された場合でも、すなわち１枚の転写材の先端側が定着器によって搬送され、後端側が転写ドラムによって搬送された場合でも、転写材に対する定着器の搬送速度と転写ドラムの搬送速度が同じなので、転写材に弛みや引っ張りが生じることはない。

【００１８】

【実施例】以下、図面に沿って、本発明の実施例について説明する。なお、本発明に係る画像形成装置全体の概略構成は、図７を参照して説明した従来の画像形成装置とほぼ同様なのでその説明は省略する。

〈実施例１〉図１に、転写材Ｐの搬送速度を制御するためのブロック図を示す。前述のように、１は感光ドラム（像担持体）、６は転写ドラム、８は定着ローラ８ａと加圧ローラ８ｂとを有する定着器である。転写ドラム６は、制御装置としてのＣＰＵ（シーケンスコントローラ）５０によって、ドライバ６Ｂを介して回転制御されるモータ（第１の駆動手段）６Ａによって回転駆動される。また定着ローラ８ａも同様に、ＣＰＵ５０によって、ドライバ８Ｂを介して回転制御されるモータ（第２の駆動手段）８Ａによって回転駆動される。そして、ＣＰＵ（制御装置）５０によって、転写ドラム６による転写材Ｐの搬送速度と、定着器８による転写材Ｐの搬送速度とが同じになるように、それぞれモータ６ａ、モータ８ａの回転が制御されている。

【００１９】前述したように、４色のトナー像の転写が完了した転写材Ｐは、分離爪１６によって転写ドラム６から分離され、定着ローラ８ａによって排紙トレイ１８上に排出される。このとき、転写材Ｐは、転写ドラム６と定着器８とによって搬送されることがある。すなわ

ち、転写材Ｐの先端が定着器８に到達して、定着器８による転写材Ｐの搬送が開始されたときでも、この転写材Ｐの後端側は依然として転写ドラム６によって担持搬送されている。さらに、転写材Ｐの搬送方向長さ（以下単に「長さ」という。）Ｌ１が長い場合には、定着器８による転写材Ｐの搬送開始後でも、まだトナー像の転写が行われていることがある。この転写ドラム６と定着器８との双方による転写材Ｐの搬送は、転写材Ｐの後端が転写ドラム６から分離されるまで続行される。

【００２０】転写ドラム６による転写材Ｐの搬送速度Ｖ０と、定着器８による転写材Ｐの搬送速度Ｖ１とに速度差ｄＶが発生すると、前述のように、転写材Ｐに弛みや引っ張りが生じ、画像の伸びやトナーの飛散り等の画像劣化が見られる。

【００２１】そこで、速度差ｄＶをなくすために、以下のようにする。まず、転写ドラム６による搬送速度Ｖ０は、本実施例では転写ドラム６の周速度と等しく、したがって転写ドラム６の半径と転写ドラム６の回転速度（モータ６Ａの回転速度）とによって算出する。これに対し、定着器８による搬送速度Ｖ１は、転写材Ｐの長さＬ１と排出センサ（速度検知手段）３４の出力とによって求める。図３に示すように、給紙カセット１０には、収納する転写材Ｐのサイズに応じた位置にサイズコマ４２が取り付けてあり、装置本体４０に給紙カセット１０を装着すると、装置本体４０側の検知スイッチ４１によりサイズコマ４２の位置が検知できるようになっている。制御手段であるＣＰＵ５０には、検知スイッチ４１の情報に対応した転写材Ｐの長さＬ１または搬送時間のテーブルが記憶されている。つまり、給紙カセット１０を装置本体４０に装着することにより、給紙カセット１０内の転写材の長さＬ１が自動的に検知される。長さＬ１が決まれば、後は定着器８による転写材Ｐの搬送時間Ｔ１がわかれば、搬送速度Ｖ１を求めることができる。搬送時間Ｔ１を検知するのが排出センサ３４である。排出センサ３４は、定着器８の出口に配置され、図２に示すように転写材Ｐの定着器による搬送時間Ｔ１、すなわち転写材Ｐの先端を検知開始してから転写材Ｐの後端が通過し終るまでの時間Ｔ１を測定する。なお、同図中Ｔ０は、転写材Ｐの正規の搬送時間であり、本実施例では、転写ドラム６による転写材Ｐの搬送時間に等しい。上述の定着器８による転写材Ｐの搬送速度Ｖ１は、

Ｖ１＝Ｌ１／Ｔ１

で算出される。したがって、転写ドラム６による搬送速度Ｖ０と定着器８による搬送速度Ｖ１との速度差ｄＶは、

ｄＶ＝Ｖ０－Ｖ１＝Ｖ０－Ｌ１／Ｔ１

となる。例えば、Ｖ０＞Ｖ１の場合（転写材Ｐが弛む場合）は、速度差ｄＶを相殺するように、転写ドラム６側のモータ６Ａの回転速度を遅くするか、または定着器８側のモータ８Ａの回転速度を速くする。反対に、Ｖ０＜Ｖ１の場合（転写材Ｐが引っ張られる場合）は、速度差ｄＶを相殺するように、転写ドラム６側のモータ６Ａの回転速度を速くするか、または定着器８側のモータ８Ａの回転速度を遅くする。Ｖ０＝Ｖ１のときは、モータ６ａ、８ａは、それぞれの回転数を維持するようにする。なお、転写ドラム６の回転を変更するか、定着器８の回転を変更するかについては、前者を変更すると、転写ドラム６に接する感光ドラム１の回転数や、転写ドラム６に対する転写材Ｐの給紙タイミング等、を変更する必要が生じ、これに対し、後者の定着器８の回転を変更する場合は、他の部材に対する影響が前者程ではないので、本実施例では、後者の定着器の回転を変更するようにしている。

【００２２】上述のモータ８ａとしてステッピングモータを用いた場合は、駆動パルスの周期を変えることによって、ステッピングモータの回転数を制御し、これにより定着器８の所定の回転を実現している。

〈実施例２〉図５及び図６は、本発明の実施例２を示す速度チャートである。本実施例では、転写ドラム６の速度を可変とする方法について説明する。なお、図４は、各部材間の距離を説明するための図である。転写材Ｐ先端が定着ローラ８ａに進入したとき、転写材Ｐの後端はまだ感光ドラム１と転写ドラム６にはさまれた状態である。さらに感光ドラム１はレーザ光により潜像が形成されている。感光ドラム１にレーザにより画像印字されている期間は、転写ドラム６の速度を変えると画像の副走査方向の密度が変わってしまうので速度可変動作は行わない。潜像形成が終了した時点で転写ドラム６を駆動するモータ６ａの速度を速やかにＶ１に変化させる。

【００２３】このとき転写位置から定着ローラ８ａ入口までの距離をＬｓとすると、転写終了時までに定着ローラ８ａで搬送される距離は（Ｌ１－Ｌｓ）であり、その時間は（Ｌ１－Ｌｓ）／Ｖ１である。この時間内に転写ドラム６で搬送される距離は（Ｌ１－Ｌｓ）×Ｖ０／Ｖ１である。この間に生ずる引っ張りもしくは弛み量をＭとすると、Ｍは、定着ローラ８ａで搬送された距離と、転写ドラム６で搬送された距離の差となるから、

Ｍ＝（Ｌ１－Ｌｓ）－（Ｌ１－Ｌｓ）×Ｖ０／Ｖ１＝（Ｌ１－Ｌｓ）（１－Ｖ０／Ｖ１）

で表される。これをグラフで表すと図５及び図６の斜線部になる。

【００２４】一方、転写位置から分離位置までの距離をＬｕとすると転写材Ｐ後端が転写位置を抜けてから分離するまでのＬｕの搬送中に引っ張りもしくは弛みをとる必要がある。この間の時間は定着器８の速度によるとＬｕ／Ｌ１となる。したがって、図５及び図６に示す２つの斜線部の面積が等しくなるように速度制御することにより、引っ張りや弛みが解消された状態で転写材Ｐを転写ドラム６と分離できる。図５は定着ローラ６の速度が正規よりも速い場合の転写ドラム６の速度の補正、図６

は定着ローラ６の速度が正規よりも遅い場合の転写ドラム６の速度の補正である。

〈実施例３〉転写材Ｐの長さＬ１は基本的には決まった数段階のものしかないが、規定外の転写材Ｐを用いた場合や手差し口からの給紙に対しても同様の制御をする。図７において３は転写材検知センサである。このセンサはジャム検知や各種タイミングのトリガのために備えられたものである。プリントシーケンスにおいて転写材Ｐ搬送中のセンサ３を監視することにより転写材Ｐの実際の長さを計測することができる。この計測値をＬ１とし排紙センサ３４の通過時間との比較をすることにより正確に定着ローラ８ａの搬送速度変化を検出できる。補正の手段は前述の実施例１あるいは実施例２のいずれでもよい。

【００２５】

【発明の効果】以上説明したように、本発明によると、転写ドラムによる転写材の搬送速度と、定着器による転写材の搬送速度との速度差を求め、制御装置によって第１の駆動手段または第２の駆動手段のうちの少なくとも一方を制御して、上述の速度差をなくすようにしたので、例えば１枚の転写材の先端側を定着器が、また後端側を転写ドラムが同時に搬送した場合でも、転写材に弛みや引っ張りが生じることはない。これにより、画像の伸びや、トナーの飛散り等の画像不良を有効に防止することができる。

【図面の簡単な説明】

【図１】実施例１の画像形成装置における転写材搬送速度についての制御ブロック図。

【図２】実施例１の排紙センサのタイミング図。

【図３】実施例１の転写材の搬送方向長さを検知する機構を示す図。

【図４】実施例２の分離爪近傍の拡大図。

【図５】実施例２の転写材の搬送速度を示す速度チャート。

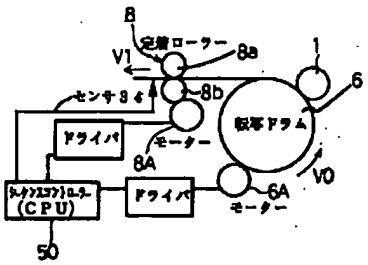
【図６】実施例２の転写材の搬送速度を示す速度チャート。

【図７】レーザビームプリンタ（画像形成装置）の概略構成を示す縦断面図。

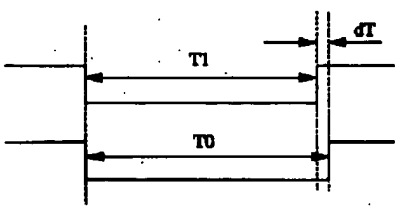
【符号の説明】

１	像担持体（感光ドラム）
２	帯電器
３	転写材検知センサ
４ａ～４ｄ	現像器
５	現像装置
６	転写ドラム
８	定着器
８ａ	定着ローラ
８ｂ	加圧ローラ
１０	給紙カセット
１６	分離爪
１８	排紙トレイ
１９	半導体レーザ
２１	ポリゴンミラー
３４	排紙センサ
４０	装置本体
４１	長さ検知手段（検知スイッチ）
４２	長さ検知手段（サイズコマ）
Ｌ１	転写材の搬送方向長さ
Ｌｓ	転写位置から定着ローラ入口までの距離
Ｌｕ	転写位置から分離位置までの距離
Ｔ０	転写ドラムによる転写材の搬送時間（正規の搬送時間）
Ｔ１	定着器による転写材の搬送時間
ｄＴ	転写ドラムによる転写材の搬送時間と、定着器による転写材の搬送時間との差（＝Ｔ０－Ｔ１）
Ｖ０	転写ドラムによる転写材の搬送速度
Ｖ１	定着器による転写材の搬送速度
ｄＶ	転写ドラムによる転写材の搬送速度と、定着器による転写材の搬送速度との速度差（Ｖ０－Ｖ１）

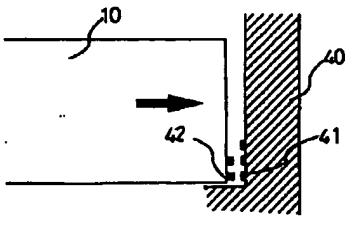
【図１】



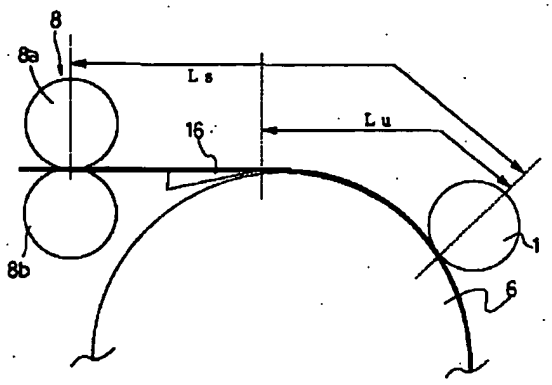
【図２】



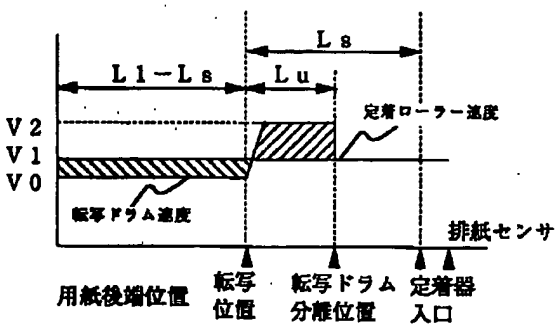
【図３】



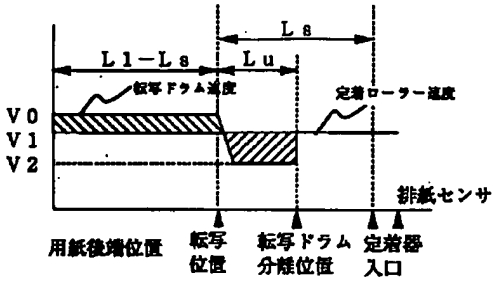
【図4】


8
8a
Ls
16
Lu
8b
1
6

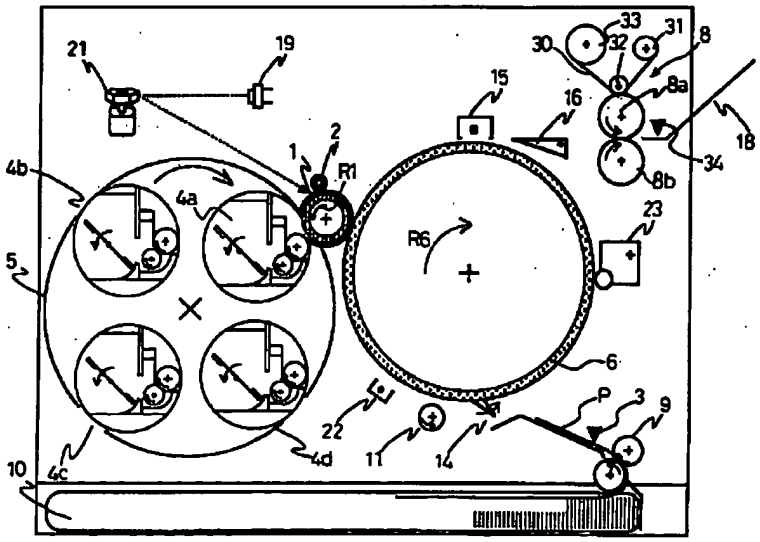
【図5】


Ls
L1－Ls
Lu
V2
V1
V0
定着ローラー速度
転写ドラム速度
排紙センサ
用紙後端位置
転写位置
転写ドラム分離位置
定着器入口

【図6】


Ls
L1－Ls
Lu
転写ドラム速度
定着ローラー速度
V0
V1
V2
排紙センサ
用紙後端位置
転写位置
転写ドラム分離位置
定着器入口

【図7】


21
19
30
33
32
31
8
8a
15
16
18
34
8b
2
1
R1
4b
4a
23
R6
5
6
P
3
9
22
11
14
4d
10
4c

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(71)Applicant : **CANON INC**
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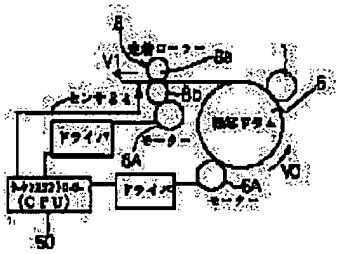
(54) IMAGE FORMING DEVICE

(57)Abstract:
PURPOSE: To eliminate the slacking and tension of a transfer material and to prevent the elongation of an image and the scattering of toner by eliminating the carrying speed difference between a transfer drum and a fixing unit with respect to the transfer material.

CONSTITUTION: The carrying speed V0 of the transfer material by the transfer drum 6 is obtained by the length of the transfer material, the speed of revolutions of the transfer drum 6, etc., and the carrying speed V1 of the transfer material by the fixing unit 8 is obtained by the length of the transfer material and the time of the passage of the transfer material on a paper ejection sensor 34 on the downstream side of the fixing unit 8. When a difference dV(=V0-V1) is made between both carrying speeds by the wearing of a fixing roller 8a, etc., a transfer material is slacked or tensed when the transfer paper is simultaneously carried by both of the transfer drum 6 and the fixing unit 8. The rotation of a motor 6A or 8A is controlled by a CPU 50 to eliminate the speed difference dV.



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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] the image formation equipment which this invention requires for image formation equipments, such as a copying machine and a laser beam printer, and changed the bearer rate of imprint material inside the body of image formation equipment in detail -- being related .
[0002]
[Description of the Prior Art] The outline configuration of the color laser beam printer of an electrophotography method is shown in drawing 7 as an example of image formation equipment. Hereafter, the configuration and actuation are explained briefly.
[0003] The body of a laser beam printer (henceforth "the body of equipment") is mostly arranged free [rotation of a photoconductor drum (image support) 1] in the center. The rotation drive of the photoconductor drum 1 is carried out at the rate of predetermined [of arrow-head R1 direction], and the front face is uniformly charged in a predetermined polarity and predetermined potential with the electrification vessel 2.
[0004] Next, paper is fed at a time to one imprint material P from a sheet paper cassette 10 to predetermined timing with the feed roller 9. And if the tip of the imprint material P is detected by the detector 3, the laser beam modulated by the picture signal is irradiated towards the polygon mirror 21 from semiconductor laser 19, and after a laser beam is scanned by the polygon mirror 21, through a lens and a mirror, it will be drawn on a photoconductor drum 1, will expose a photoconductor drum 1 top, and will form the 1st electrostatic latent image. Development counter 4a of the developer 5 of a rotating type adheres to a toner, this 1st electrostatic latent image is developed, and the 1st toner image of a Magenta color is formed on a photoconductor drum 1.
[0005] The imprint drum 6 grasps the tip of the imprint material P to which paper was fed to predetermined timing by the gripper 14, and supports it with the condition of having adsorbed so that the whole imprint material P might be coiled with the adsorption high pressure belt electrical machinery 22. The imprint bias voltage of a toner and antipole nature is impressed to the imprint drum 6, and, thereby, the 1st toner image on a photoconductor drum 1 is imprinted on the imprint material P.
[0006] The 2nd, 3rd, and 4th toner image is imprinted one by one to the imprint material P on the imprint drum 6 on which the 1st toner image was imprinted. After the photoconductor drum 1 which the imprint of the 1st toner image ended is cleaned by the cleaner, it is again charged with the electrification vessel 2, and receives the scan of a laser beam, and the 2nd electrostatic latent image is formed in a front face. This 2nd electrostatic latent image is developed by development counter 4b which switched to the development location and has been arranged by rotation of a developer 5, and turns into a toner image of cyanogen. The toner image of this cyanogen is imprinted by the imprint material P on the imprint drum 6. After the 3rd electrostatic latent image is similarly formed on a photoconductor drum 1 and negatives are developed by development counter 4c as a toner image of yellow, it imprints on the imprint material P. Subsequently, the 4th electrostatic latent image is formed, negatives are developed as a toner image of black by 4d of development counters, and it imprints on the imprint material P. In this way, the toner image of four colors laps on the imprint material P, and it imprints.
[0007] The separation pawl 16 contacts the front face of the imprint drum 6, and the imprint material P which the imprint of a toner image ended makes the imprint material P separate from the imprint drum 6, when a point approaches the location of the separation pawl 16. The separation pawl 16 will return to the original location, if the back end of the imprint material P separates from the imprint drum 6. While the stored charge on the imprint material P is discharged with the electrification vessel 15 and making easy separation of the imprint material P by the separation pawl 16 in that case, aerial discharge is decreased at the time of separation.
[0008] The imprint material P separated from the imprint drum 6 advances into a fixing assembly 8. A fixing assembly 8 has fixing roller 8a and pressurization roller 8b by which the pressure welding was carried out to this from the lower part, and fixing roller 8a is heated by the halogen heater from the interior. In case the imprint material P passes fixing roller 8a, melting fixing of the surface non-established toner image is carried out, and it is fixed to it. The imprint material P fixed to the toner image is discharged on the paper output tray 18 of the exterior of an equipment body after that. In addition, 11 are an electric discharge roller from which the unnecessary charge on the imprint drum 6 is removed among this drawing, and 23 is the cleaning device in which imprint drum 6 front face is cleaned.
[0009] By the laser beam printer of an above-mentioned configuration, it is supplied from a sheet paper cassette 10 at first, and the bearer rate is usually uniformly set up for the imprint material finally discharged on a paper output tray 18 in the interior of the body of equipment.

[0010] Moreover, in order to improve fixable [of a toner image], the following solved the fixing assembly 8 and it has provided the means. A high pressure is put on the 1st on the imprint material P which passes through between with two rollers, fixing roller 8a arranged up and down and pressurization roller 8b, and it is raising fixable. In order to eliminate the offset toner which tends to adhere to a fixing roller 8a front face as the 2nd, it has prepared in the web 30. A web 30 is a band-like sheet, being wound around the web feed roller 31 and rolled round little by little by the web rolling-up roller 33, was pressed by the web roller 32 and has cleaned the fixing roller 8a front face. According to the predetermined rotation of fixing roller 8a, the amount of rolling up of the rolling-up roller 33 is controlled, and cleaning on fixing roller 8a is performed good.
[0011]
[Problem(s) to be Solved by the Invention] However, according to the above-mentioned conventional example, the following troubles have occurred by having provided the above-mentioned means for the improvement in the fixing engine performance.
[0012] Since the pressure between fixing roller 8a and pressurization roller 8b is made high, deformation occurs [1st] on these rollers. A fixing roller 8a front face will be deleted by cleaning of a fixing roller 8a front face, and the diameter of a roller will change to the 2nd. Thus, if roller deformation and change of the diameter of a roller arise, even if the rotational frequency (rotational speed) of fixing roller 8a is fixed, the peripheral velocity will change, therefore the bearer rate of the imprint material P will change.
[0013] When the bearer rate of the imprint material P by the fixing assembly 8 changes, the speed difference will occur between the peripheral velocity of the imprint drum 6 arranged at the upstream (about the conveyance direction of imprint material). Pinching conveyance of the tip side may be carried out at a fixing assembly 8, a back end side may be supported by coincidence at imprint material, and slack and hauling produce the imprint material P in the imprint material P by the above-mentioned speed difference in this case. When the imprint material P under imprint was pulled, it leaped up, when the elongation and ** to exceed of an image happened and the back end section of the imprint material P dissociated from the imprint drum 6, and had become the factor of image degradation -- the toner before fixing scatters.
[0014] Then, that the above-mentioned problem should be solved, this invention abolishes the bearer rate difference of imprint material, and aims at offering the elongation of an image, and the image formation equipment which is worn and prevented image degradation of spilling of a toner etc.
[0015]
[Means for Solving the Problem] The image support by which this invention is made in view of the above-mentioned situation, and a toner image is formed in a front face, In image formation equipment equipped with the anchorage device established in the toner image on this imprint material, carrying out pinching conveyance of the imprint material separated into the imprint material supported on the front face from the imprint drum on which said toner image is imprinted, and this imprint drum The 1st driving means which drives said imprint drum, and the 2nd driving means which drives said fixing assembly, The bearer rate of the imprint material control these 1st and 2nd driving means according to an individual, respectively, and according to said imprint drum, It has the control means which changes the bearer rate of the imprint material by said fixing assembly according to an individual, and a rate detection means to detect the bearer rate of the imprint material by said fixing assembly. Said control means It is characterized by controlling at least one side among said 1st and 2nd driving means, and making in agreement the bearer rate of the imprint material on said imprint drum, and the bearer rate of the imprint material by said fixing assembly based on the output of said rate detection means.
[0016] In this case, a die-length detection means to detect the conveyance lay length of said imprint material, It has a conveyance time amount detection means to detect the conveyance time amount of said imprint material on said imprint drum, and a conveyance time amount detection means to detect the conveyance time amount of said imprint material by said fixing assembly. Said control means You may make it compute the bearer rate of the imprint material on said imprint drum, and the bearer rate of the imprint material by said fixing assembly based on these two conveyance time amount and the die length of said imprint material.
[0017]
[Function] Since the bearer rate of a fixing assembly and the bearer rate of an imprint drum to imprint material are the same when imprint material is conveyed by an imprint drum and the fixing assembly at coincidence based on a configuration above, or when the tip side of imprint material of one sheet is conveyed by the fixing assembly and a back end side is conveyed on an imprint drum, neither slack nor hauling arises in imprint material.
[0018]
[Example] Hereafter, the example of this invention is explained along with a drawing. In addition, since the outline configuration of the whole image formation equipment concerning this invention is the same as that of the conventional image formation equipment explained with reference to drawing 7 almost, the explanation is omitted.
<Example 1> The block diagram for controlling the bearer rate of the imprint material P to drawing 1 is shown. As mentioned above, 1 is a fixing assembly in which a photoconductor drum (image support) and 6 have an imprint drum, and 8 has fixing roller 8a and pressurization roller 8b. The rotation drive of the imprint drum 6 is carried out by motor (1st driving means) 6A in which a roll control is carried out through driver 6B by CPU (sequence controller)50 as a control device. Moreover, a rotation drive is carried out by motor (2nd driving means) 8A to which the roll control also of the fixing roller 8a is similarly carried out by CPU50 through driver 8B. And rotation of motor 6a and motor 8a is controlled by CPU (control unit)50, respectively so that the bearer rate of the imprint material P on the imprint drum 6 and the bearer rate of the imprint material P by the fixing assembly 8 become the same.
[0019] As mentioned above, it is separated from the imprint drum 6 by the separation pawl 16, and the imprint material P which

the imprint of the toner image of four colors completed is discharged by fixing roller 8a on a paper output tray 18. The imprint material P may be conveyed by the imprint drum 6 and the fixing assembly 8 at this time. That is, even when the tip of the imprint material P reaches a fixing assembly 8 and conveyance of the imprint material P by the fixing assembly 8 is started, support conveyance of the back end side of this imprint material P is still carried out on the imprint drum 6. Furthermore, when the conveyance direction die length (only henceforth "die length") L1 of the imprint material P is long, the imprint of a toner image may still be performed also after conveyance initiation of the imprint material P by the fixing assembly 8. Conveyance of the imprint material P by the both sides of this imprint drum 6 and fixing assembly 8 is continued until the back end of the imprint material P is separated from the imprint drum 6.

[0020] if the speed difference dV occurs in the bearer rate V0 of the imprint material P on the imprint drum 6, and the bearer rate V1 of the imprint material P by the fixing assembly 8 -- above -- the imprint material P -- slack and hauling -- being generated -- the elongation of an image, and a toner -- scattering -- etc. -- image degradation is seen.

[0021] Then, it is made to be the following in order to abolish the speed difference dV. First, by this example, the bearer rate V0 on the imprint drum 6 is equal to the peripheral velocity of the imprint drum 6, therefore is computed with the radius of the imprint drum 6, and the rotational speed (rotational speed of motor 6A) of the imprint drum 6. On the other hand, it asks for the bearer rate V1 by the fixing assembly 8 with the die length L1 of the imprint material P, and the output of the discharge sensor (rate detection means) 34. As shown in drawing 3 , if a size coma 42 is attached in the location according to the size of the imprint material P to contain and the body 40 of equipment is equipped with a sheet paper cassette 10, to a sheet paper cassette 10, the location of a size coma 42 can be detected with the detection switch 41 by the side of the body 40 of equipment. The die length L1 of the imprint material P corresponding to the information on the detection switch 41 or the table of conveyance time amount is memorized by CPU50 which is a control means. That is, the die length L1 of the imprint material in a sheet paper cassette 10 is automatically detected by equipping the body 40 of equipment with a sheet paper cassette 10. If die length L1 is decided, if the conveyance time amount T1 of the imprint material P by the fixing assembly 8 understands the rest, it can ask for a bearer rate V1. The discharge sensor 34 detects the conveyance time amount T1. The discharge sensor 34 is arranged at the outlet of a fixing assembly 8, and measures the time amount T1 as shown in drawing 2 , after carrying out detection initiation of the conveyance time amount T1 by the fixing assembly of the imprint material P, i.e., the tip of the imprint material P, until the back end of the imprint material P finishes passing. In addition, the inside T0 of this drawing is the conveyance time amount of the normal of the imprint material P, and is equal to the conveyance time amount of the imprint material P on the imprint drum 6 in this example. The bearer rate V1 of the imprint material P by the above-mentioned fixing assembly 8 is computed by V1=L1/T1. Therefore, the speed difference dV of the bearer rate V0 on the imprint drum 6 and the bearer rate V1 by the fixing assembly 8 is set to dV=V0-V1=V0-L1/T1. For example, in the case of V0>V1, rotational speed of motor 6A by the side of the imprint drum 6 is made late, or it makes quick rotational speed of motor 8A by the side of a fixing assembly 8 so that the speed difference dV may be offset (when the imprint material P slackens). On the contrary, in the case of V0<V1, rotational speed of motor 6A by the side of the imprint drum 6 is made quick, or it makes late rotational speed of motor 8A by the side of a fixing assembly 8 so that the speed difference dV may be offset (when the imprint material P is pulled). At the time of V0=V1, Motors 6a and 8a maintain each rotational frequency. in addition, about whether rotation of the imprint drum 6 is changed or rotation of a fixing assembly 8 is changed The rotational frequency of the photoconductor drum 1 which will touch the imprint drum 6 if the former is changed, Since the effect to other members is not the former when it will be necessary to change the feed timing of the imprint material P to the imprint drum 6 etc. on the other hand and changes rotation of the latter fixing assembly 8, he is trying to change rotation of the latter fixing assembly in this example.

[0022] When a stepping motor is used as above-mentioned motor 8a, by changing the period of a driving pulse, the rotational frequency of a stepping motor was controlled and this has realized predetermined rotation of a fixing assembly 8.

<Example 2> Drawing 5 and drawing 6 are rate charts which show the example 2 of this invention. This example explains how to make the rate of the imprint drum 6 adjustable. In addition, drawing 4 is drawing for explaining the distance between each part material. When an imprint material P tip advances into fixing roller 8a, the back end of the imprint material P is in the condition still inserted into the photoconductor drum 1 and the imprint drum 6. Furthermore, as for the photoconductor drum 1, the latent image is formed of the laser beam. Since the consistency of the direction of vertical scanning of an image will change if the period by which image printing is carried out with laser changes the rate of the imprint drum 6 into a photoconductor drum 1, rate adjustable actuation is not performed. When latent-image formation is completed, the rate of motor 6a which drives the imprint drum 6 is promptly changed to V1.

[0023] When distance from an imprint location to a fixing roller 8a inlet port is set to Ls at this time, the distance conveyed by fixing roller 8a by the time of imprint termination is (L1-Ls), and that time amount is (L1-Ls) / V1. The distance conveyed on the imprint drum 6 in this time amount is x(L1-Ls) V0/V1. Since it becomes the difference of the distance conveyed on the distance which is produced in the meantime, and from which M was conveyed by fixing roller 8a, and the imprint drum 6 when it pulled or the amount of slack was set to M, it is M=(L1-Ls)-(L1-Ls) xV0/V1= (L1-Ls) (1-V0/V1).

It is come out and expressed. If this is expressed with a graph, it will become drawing 5 and the slash section of drawing 6 .

[0024] It is necessary to pull during conveyance of Lu if distance from an imprint location to a separation location is set to Lu, after the imprint material P back end will escape from an imprint location on the other hand until it dissociates, or to take slack. According to the rate of a fixing assembly 8, time amount in the meantime serves as Lu/L1. Therefore, by controlling the speed so that the area of the two slash sections shown in drawing 5 and drawing 6 may become equal, where hauling and slack are canceled, the imprint material P is separable with the imprint drum 6. Amendment of the rate of the imprint drum 6 when the rate of drawing 5 of a fixing roller 6 is quicker than normal, and drawing 6 are amendments of the rate of the imprint drum 6 when

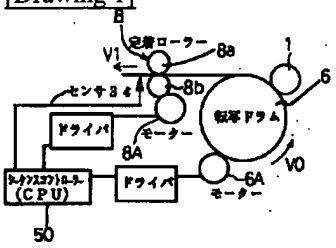
the rate of a fixing roller 6 is slower than normal.
<Example 3> Although the die length L1 of the imprint material P has only several steps of regular things fundamentally, same control is carried out also to feeding from the case where the imprint material P besides a convention is used, or manual bypass opening. In drawing 7 , 3 is an imprint material detection sensor. It has this sensor for the trigger of jam detection or various timing. The actual die length of the imprint material P is measurable by supervising the sensor 3 under imprint material P conveyance in a print sequence. Bearer rate change of fixing roller 8a is detectable to accuracy by setting this measurement value to L1, and carrying out the comparison with the pass time of the delivery sensor 34. Any of the above-mentioned example 1 or an example 2 are sufficient as the means of amendment.
[0025]
[Effect of the Invention] The bearer rate [according to / as explained above / this invention] of the imprint material on an imprint drum, Since the speed difference with the bearer rate of the imprint material by the fixing assembly is searched for, either [at least] the 1st driving means or the 2nd driving means is controlled by the control unit and the above-mentioned speed difference was abolished For example, even when an imprint drum conveys [a fixing assembly] a back end side to coincidence again, neither slack nor hauling produces the tip side of imprint material of one sheet in imprint material. thereby -- the elongation of an image, and a toner -- scattering -- etc. -- a poor image can be prevented effectively.

[Translation done.]

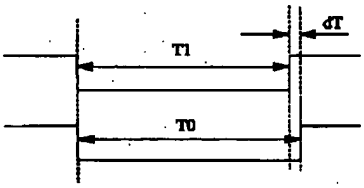
* NOTICES *

DRAWINGS

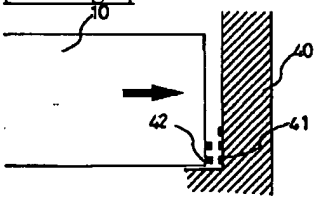
[Drawing 1]



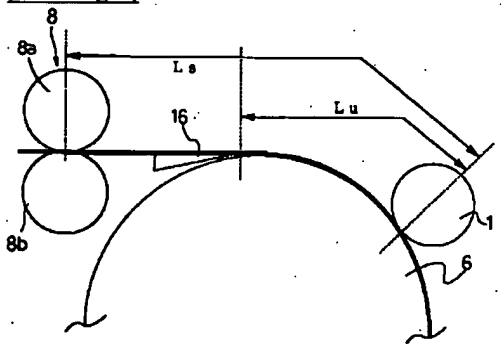
[Drawing 2]



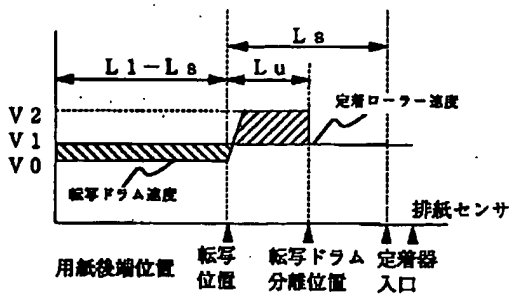
[Drawing 3]



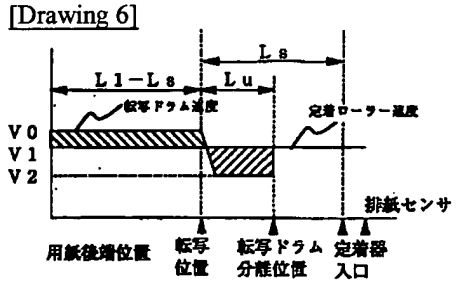
[Drawing 4]



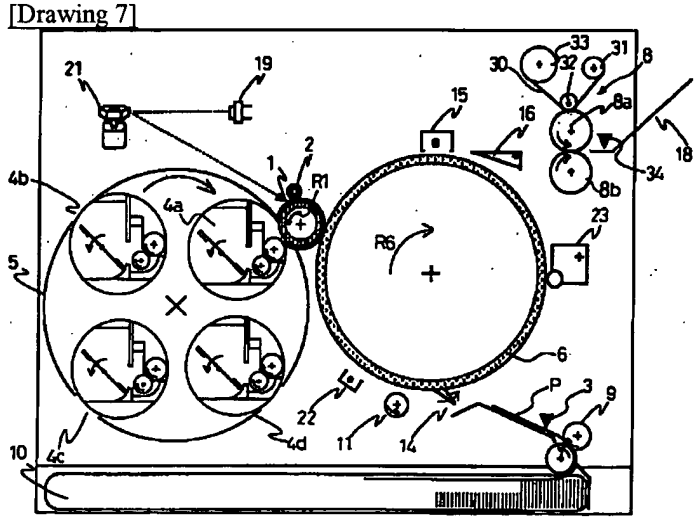
[Drawing 5]



[Drawing 6]



[Drawing 7]



[Translation done.]

Computer Translation

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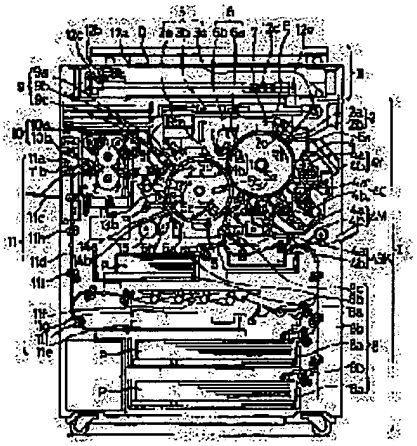
(54) IMAGE FORMING DEVICE AND ITS IMAGE CONTROLLING METHOD

(57)Abstract:
PURPOSE: To attain effective fixing on recording materials of various shapes without increasing the size of a device.
CONSTITUTION: The surface of a photosensitive drum 1 and that of a transfer drum 5a are moved at a process speed so as to transfer a toner image on the drum 1 to a recording material P on the drum 5a. The recording material P is separated from the drum 5a by a separating means 9 and heated and pressed by a fixing unit 10 to fix a toner image on the material P. Since a distance between the means 9 and the unit 10 is set up shorter than the length of the material P in a carrying direction, the leading end side and rear end side of a recording material P are simultaneously carried by the unit 10 and the drum 5a. When the material P is thick paper or the like, the carrying speed of the material P by the unit 10 is delayed to improve fixing performance. In accordance with the delay of the carrying speed, the process speed of both the drums 5a, 1 is delayed. In order to prevent the charging amount of the drum 1 from being increased by a charger, glid bias voltage is reduced and the charging amount and charging potential are set up to the same value.



LEGAL STATUS

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[Date of extinction of right]	

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to image formation equipments, such as a copying machine using an electrophotography method, and a printer, especially the image formation equipment which changes image formation conditions suitably according to the description of record material used as the fixation place of ****, and its image control approach.
[0002]
[Description of the Prior Art] Recently, in image formation equipments using an electrophotography method, such as a copying machine and a printer, various record material carries out various usage. The magnitude of record material, such as B5, A4, B4, and A3 (JIS), the basis weight of record material (thickness), Furthermore, the construction material of the record material of paper, an OHP sheet (transparent sheet made of resin for over head projectors), etc. (class), Or the physical conditions of record material, such as a record material physical property which performs image formation on one side of the same record material, carries out to both sides, or (condition) changes with temperature, humidity, etc. of an installation of image formation equipment, (it is called "description" below.) One image formation equipment performs image formation to variously different record material. Therefore, according to the description of these record material, image formation conditions are changed suitably, and good image formation is made to be performed.
[0003] Drawing 9 is drawing of longitudinal section showing the outline configuration of 4 color full color image formation equipment as an example of color picture formation equipment.
[0004] first -- if the configuration of image formation equipment is explained briefly -- the body of equipment -- it has the electrophotography photoconductor drum 1 as image support in the center mostly. The photoconductor drum 1 is supported free [a revolution] in the arrow-head R1 direction, and the primary electrification machine 2, the exposure means 3, a developer 4, imprint equipment 5, and the cleaning machine 6 are arranged in the perimeter in order along the hand of cut. Moreover, under the imprint equipment 5, the feed conveyance section 8 of the record material P is arranged. The feed conveyance section 8 has two or more sheet paper cassette 8a which carries out the loading receipt of the record material P from which magnitude differs, respectively, and sheet paper cassette 8a to feed roller 8b which feeds paper to the record material P, resist roller 8c, etc., and forms the conveyance pass illustrated by this drawing dotted line. The separation means 9, the fixing assembly 10, and the delivery unit 11 are arranged in order at the downstream of imprint equipment 5.
[0005] It continues, and actuation of the image formation equipment of an above-mentioned configuration is explained, adding a configuration suitably. As for the photoconductor drum 1 in which revolution actuation was carried out by the non-illustrated driving means in the arrow-head R1 direction, the front face is charged in homogeneity with the primary electrification vessel 2. The exposure means 3 irradiates the light figure E which has the manuscript scan section and a color separation filter, and is equivalent to the light figure E whose color was separated, or this. As an exposure means 3, a laser beam aligner can be used, for example, a light figure E (for example, light figure of yellow) is irradiated for every decomposition color, the charge of an exposure part is removed on photoconductor drum 1 front face charged in homogeneity, and an electrostatic latent image is formed in it. A developer 4 develops an electrostatic latent image. A developer 4 has four development counters carried in revolution base material 4e by which revolution actuation is carried out a core [4d of medial axes], and revolution base material 4e, i.e., yellow, a Magenta, cyanogen, the development counters 4Y, 4M, and 4C that contained the toner of each color of black, and 4Bk. And by the revolution of revolution base material 4e, it is moved to the development location which counters photoconductor drum 1 front face, and development counter 4Y of the yellow with which development is presented makes the toner of yellow adhere to the electrostatic latent image on a photoconductor drum 1 through a development sleeve, and forms a toner image.
[0006] The toner image of yellow is imprinted by the record material P supplied to imprint equipment 5 from the feed conveyance section 8. Two or more sheet paper cassette 8a which carries out the loading receipt of the record material P from which magnitude differs at the feed conveyance section 8, respectively is arranged, and the predetermined record material P is supplied to imprint equipment 5 to predetermined timing through feed roller 8b, many conveyance rollers, and resist roller 8c. Adsorption roller 5d which counters adsorption zone electrical machinery 5c for imprint equipment 5 to carry out electrostatic adsorption of the imprint drum 5a, imprint electrification machine 5b, and record material P, and this, It has inside electrification machine 5e and 5f of outside electrification machines, and record material support sheet 5g which becomes the peripheral surface opening region from a dielectric is stretched in one in the shape of a cylinder in the arrow-head R5 direction at imprint drum 5a by which revolution actuation is carried out. The record material P supplied from the feed conveyance section 8 is

adsorbed on an imprint drum 5a front face, it rotates in the arrow-head R5 direction with the revolution of imprint drum 5a, and the toner image of the yellow on a photoconductor drum 1 is imprinted by imprint electrification machine 5b. A surface residual toner is removed and the next image formation is presented with the photoconductor drum 1 after a toner image imprint.
[0007] Above, the imprint of the toner image of the yellow to the record material P is completed. The same image formation process is repeatedly performed also about each color of other Magentas, cyanogen, and black, and, thereby, the toner image of 4 classification by color is imprinted on the record material P on imprint drum 5a.
[0008] Separation electrification machine 9a of the separation means 9 and separation pawl 9b dissociate from an imprint drum 5a front face, and the record material P which the imprint of the toner image of four colors ended is conveyed by the fixing assembly 10 where the toner image non-established (it has adhered electrostatic) is supported on a front face.
[0009] Having fixing roller 10a which connoted the heater (heat source), and application-of-pressure roller 10b by which the pressure welding was carried out to this from the lower part, and carrying out pinching conveyance of the record material P in the nip section of both the rollers 10a and 10b, a fixing assembly 10 carries out heating application of pressure, carries out melting fixing of the toner image, and is established. The record material P after fixation is discharged on a paper output tray 11, and full color image formation completes it four colors.
 [0010] Above-mentioned image formation is performed to the record material of different various descriptions, such as magnitude, thickness, a property, a condition, and an operating environment, as mentioned above. Therefore, on the occasion of image formation, for example in image support or a fixing assembly, according to the description of each record material, image formation conditions are changed suitably, and, thereby, 4 color full color image of suitable image quality is formed.
[0011]
[Problem(s) to be Solved by the Invention] In the fixing assembly 10 of above-mentioned image formation equipment, carrying out pinching conveyance of the record material P, heating application of pressure is carried out and melting fixing of the toner image is carried out on the record material P. A heating value required for melting fixing of this toner image changes with the descriptions of the record material P comparatively a lot. When the descriptions of the record material P differ, it is because the heat capacities of every record material P differ. For example, the record material P is cardboard with thick thickness (basis weight is 127g/m2. the paper more than extent is said). below the same. it is -- the fixing assembly 10 which has a heat source only in the fixing roller 10a side which is hard to be heated since heat capacity of a case is large, and contacts the toner image on the front face of cardboard directly especially -- the heat from application-of-pressure roller 10b by the side of the rear face of cardboard -- propagation -- being hard -- the heating value which heating is inadequate for a sake and is given to it tends to be insufficient -- there was a possibility that a next door and poor fixation might occur. There are an OHP sheet, an envelope, etc. as record material P for which a heating value tends to be insufficient in addition to cardboard. Moreover, the record material P is standard paper (basis weight is 64 g/m2 - 105 g/m2. the paper which is extent is said). below the same. it is -- even if -- at the time of the image formation of the 2nd side after the image formation termination of the 1st side at the time of double-sided image formation, a heating value becomes insufficient similarly.
[0012] There is the approach of making late the bearer rate (henceforth a "fixation bearer rate") of the record material P in a fixing assembly 10 as a policy which cancels the lack of a heating value. It is the approach of making [many] the heating value which lengthens fixation time amount and gives it. Since the optimal heating value for the description of each record material P can be given when this approach selects a fixation bearer rate according to the description of the record material P, when fixable is considered, it turns out that it is a very effective means.
[0013] However, when this approach was adopted, there was a problem that the whole equipment was enlarged. In the image formation of a configuration of being shown in drawing 9 , it moves in an arrow head R1 and the R5 direction at a predetermined process speed (peripheral velocity) in photoconductor drum 1 front face and an imprint drum 5a front face, respectively. And after imprint drum 5a is adsorbed and the imprint of a toner image is completed, sequential separation of the record material P is carried out from a head side by the separation means 9. At this time, the record material P under separation actuation from separation initiation to separation termination is conveyed by imprint drum 5a towards a fixing assembly 10 with the same speed as process speed.
[0014] Here, the record material P of one sheet will have the head side conveyed by the fixing assembly 10, and when the distance from the separation means 9 to a fixing assembly 10 is shorter than the conveyance direction die length of the record material P, before separation actuation is completed thoroughly, the head of the record material P reaches a fixing assembly 10, and it will be simultaneously conveyed by imprint drum 5a in a back end side. For this reason, if the fixation bearer rate of a fixing assembly 10 is made later than process speed in order to raise fixable [of the toner image by the fixing assembly 10] as mentioned above, the speed difference will produce the record material P between the quick back end sides of a bearer rate the late head side of a bearer rate, and a loop formation will be formed in the conveyance direction pars intermedia. If a loop formation forms, the part into which the loop formation swelled contacts a surrounding member, a jam will be generated or a non-established toner image will fail to be scratched.
[0015] Moreover, the back end section bounds according to the stability of the record material P to which the record material P tends to cancel a loop formation when, and, as for the record material P, the back end escapes from the separation means 9, it is shocking and the possibility that the non-established toner on the record material P may be confused exists. It is possible to set up the distance of Hazama of the separation means 9 and a fixing assembly 10 as one policy for preventing turbulence of such a jam or a toner for a long time than the conveyance direction die length of the record material P used with the image formation equipment. by carrying out like this, it abolishes that the record material P of one sheet is simultaneously conveyed by a fixing assembly 10 and imprint drum 5a, and a loop formation is formed in pars intermedia -- thing prevention is carried out.

[0016] However, extension of the distance of the separation means 9 and a fixing assembly 10 generates the problem that the whole image formation equipment will be enlarged shortly. In addition, this problem is a problem generated also when changing a fixation bearer rate according to environments, such as atmospheric temperature of the location in which image formation equipment is installed, and humidity, although it is as above-mentioned to be generated in order to change a fixation bearer rate according to the description of the record material P. Furthermore, about a fixation bearer rate, also when making it quick, of course when making it late as mentioned above, the same problem occurs. For example, since it is thinner than standard paper, when the record material P wants to speed up a fixation bearer rate, with the case of cardboard, there is a possibility of the bearer rate by the side of the head of the record material P being quick, the bearer rate by the side of the back end becoming slow, and the whole record material P being pulled in the conveyance direction, and damaging conversely. Therefore, it is necessary to set up the distance of Hazama of the separation means 9 and a fixing assembly 10 similarly also in this case for a long time than the conveyance direction die length of the record material P. That is, in any case, it will be that equipment tends to be enlarged if it is going to change a fixation bearer rate.
[0017] Then, this invention aims at offering the image formation equipment which enabled it to perform always good fixation corresponding to change of the description of record material, and its image control approach that an above-mentioned problem should be solved, without being accompanied by enlargement of image formation equipment.
[0018]
[Means for Solving the Problem] A development means to develop with a developer the latent image which this invention was made in view of the above-mentioned situation, and was formed in the movable image support front face, The record material support which supports and conveys the record material used as the imprint place of this **** on a front face, An imprint means to imprint **** on said image support to the record material on said record material support, In image formation equipment equipped with a fixation means by which **** is established on this record material while conveying the record material conveyed from said record material support where **** which is not established [which was imprinted] is supported While changing the record material bearer rate in said fixation means, based on modification of the passing speed of said image support front face corresponding to modification of this record material bearer rate, it is characterized by changing the image formation conditions in said image support.
[0019] In this case, said image support and said record material support interlock, and you may make it the passing speed of said image support front face and the record material bearer rate by said record material support have a response relation.
[0020] Moreover, it may have an electrification means by which said image support front face is charged uniformly, and modification of the image formation conditions in said image support may be modification of the amount of electrifications of said image support front face by said electrification means.
[0021] furthermore, the description which detects the description of said record material -- it has a detection means and the record material bearer rate in said fixation means can be changed based on the description of the record material which this detection means detects.
[0022] In addition, said development means has two or more development counters which have a differing [colors] developer, respectively, and you may make it form **** of two or more colors on said record material through said image support with these development counters.
[0023] A development means to develop with a developer the latent image formed in the image support front face where the image control approach is movable, The record material support which supports and conveys the record material used as the imprint place of this **** on a front face, An imprint means to imprint **** on said image support to the record material on said record material support, In the image control approach in image formation equipment equipped with a fixation means by which **** is established on this record material while conveying the record material conveyed from said record material support where **** which is not established [which was imprinted] is supported The process which changes the record material bearer rate in said fixation means, and the process which changes the passing speed of said image support front face corresponding to modification of this record material bearer rate, The image control approach characterized by having the process which changes the image formation conditions in said image support based on modification of the passing speed of this image support front face.
[0024]
[Function] Above, based on a configuration, according to the description (for example, thickness of record material) of the record material used for image formation, a record material bearer rate (fixation bearer rate) is changed so that fixation of **** by the fixation means may be performed good. It is made to correspond to modification of this fixation bearer rate, the passing speed (process speed) of an image support front face is changed, and the image formation conditions in image support are further changed according to this. Therefore, image formation before fixation and fixation is performed good. Under the present circumstances, generally, if the passing speed of an image support front face is changed, this will be interlocked with and the bearer rate of the record material by record material support will also change. Therefore, when changing a fixation bearer rate, so that this fixation bearer rate and the record material bearer rate by record material support may become the same Even when changing the passing speed of an image support front face and a head [of one sheet / of record material] and back end side is simultaneously conveyed by the fixation means and record material support, respectively, a loop formation occurs in record material pars intermedia, or record material pars intermedia is not pulled by the cross direction. For this reason, it is not necessary to take a distance of a separation means and a fixing assembly longer than the conveyance direction die length of record material.
[0025]

[Example] Hereafter, the example of this invention is explained along with a drawing.
<Example 1> Drawing 1 is drawing of longitudinal section of a digital method showing the outline configuration of full color image formation equipment four colors as an example of the image formation equipment concerning this invention.
[0026] The image formation equipment shown in this drawing forms an image in the record material P by the printer section I based on the image of the manuscript D which is equipped with the lower digital color picture printer section (only henceforth the "printer section") I, and the upside digital color picture reader section (only henceforth the "reader section") II, for example, was read in the reader section II.
[0027] Hereafter, the printer section I configuration and explains the configuration of the reader section II briefly continuously.
[0028] The printer section I has the photoconductor drum 1 as image support by which revolution actuation is carried out in the arrow-head R1 direction. Around the photoconductor drum 1, the primary electrification machine (electrification means) 2, the exposure means 3, a developer (development means) 4, imprint equipment 5, the cleaning machine 6, and the pre-exposure lamp 7 grade are arranged in order along the hand of cut. The feed conveyance section 8 of the record material P is arranged at the lower part of imprint equipment 5, i.e., the bottom half section of the printer section I, further, the separation means 9 is arranged in the upper part of imprint equipment 5, and the fixing assembly 10 and the delivery unit 11 are arranged at the downstream (downstream about the conveyance direction of the record material P) of the separation means 9.
[0029] A photoconductor drum 1 has photo conductor 1b of a wrap OPC (organic light semi-conductor), and base 1a and the front face of the shape of a drum made from aluminum are constituted so that revolution actuation may be carried out by the driving means (un-illustrating) at a predetermined process speed (peripheral velocity) in the arrow-head R1 direction. In addition, a photoconductor drum 1 is explained in full detail behind.
[0030] The primary electrification machine 2 is a corona-electrical-charging machine which has the bus-bar of a photoconductor drum 1, discharge wire 2b arranged by parallel, and grid 2c which is arranged by opening of shielding 2a and regulates electrification potential inside shielding 2a in which the part which counters a photoconductor drum 1 carried out opening, and shielding 2a. According to a power source (un-illustrating), electrification bias is impressed and, thereby, the primary electrification machine 2 is charged in a predetermined polarity and predetermined potential in photoconductor drum 1 front face at homogeneity.
[0031] The exposure means 3 has the laser output section (un-illustrating) which emits light in a laser beam based on the picture signal from the below-mentioned reader section II, polygon mirror 3a which reflects a laser beam, lens 3b, and mirror 3c. When this laser beam irradiates photoconductor drum 1 front face, the exposure means 3 exposes a photoconductor drum 1, and it is constituted so that the charge of an exposure part may be removed and an electrostatic latent image may be formed. In this example, based on the image of a manuscript, the color of the electrostatic latent image formed in photoconductor drum 1 front face is separated into four colors of yellow, cyanogen, a Magenta, and black, and sequential formation of the electrostatic latent image corresponding to each color is carried out.
[0032] The developer 4 is equipped with four development counters, i.e., the yellow which used resin as the base, respectively, cyanogen, a Magenta, the development counters 4Y, 4C, and 4M that contained the toner (developer) of each color of black, and 4Bk sequentially from the upstream along the hand of cut (arrow-head R1 direction) of a photoconductor drum 1. The development counter of the predetermined color with which each development counters 4Y, 4C, and 4M and 4Bk have development sleeve 4a which makes a toner adhere to the electrostatic latent image formed in photoconductor drum 1 front face, respectively, and the development of an electrostatic latent image is presented by eccentric-cam 4b It is arranged in the development location which approaches photoconductor drum 1 front face alternatively, and a toner is made to adhere to an electrostatic latent image through development sleeve 4a, and it is constituted so that the toner image as **** may be formed. In addition, the development counter of other three colors other than the development counter with which development is presented is evacuated from a development location.
[0033] Imprint drum (record material support) 5a with which imprint equipment 5 supports the record material P on a front face, Imprint electrification machine (imprint means) 5b of the shape of a brush which imprints the toner image on a photoconductor drum 1 to the record material P, Adsorption roller 5d which counters adsorption zone electrical machinery 5c for making the record material P stick to imprint drum 5a, and this, It has inside electrification machine 5e and 5f of outside electrification machines, and record material support sheet 5g which consists of a dielectric is stretched by the peripheral surface opening region of imprint drum 5a supported to revolve so that revolution actuation might be carried out in the arrow-head R5 direction in one in the shape of a cylinder. Record material support sheet 5g, dielectric sheets, such as a polycarbonate film, are used. Imprint equipment 5 is constituted so that the record material P may be adsorbed and supported on an imprint drum 5a front face.

[0034] The cleaning machine 6 is equipped with cleaning-blade 6a which fails to scratch the residual toner which remained in photoconductor drum 1 front face, without the record material P imprinting, and cleaning container 6b which collects the toners which it failed to scratch.
[0035] The pre-exposure lamp 7 adjoins the upstream of the primary electrification machine 2, and is arranged, and a charge with photoconductor drum 1 unnecessary front face cleaned with the cleaning vessel 6 is removed.
[0036] The feed conveyance section 8 has feed roller 8b which feeds paper to the record material P in two or more sheet paper cassette 8a which carries out the loading receipt of the record material P from which magnitude differs, and sheet paper cassette 8a, many conveyance rollers, resist roller 8c, etc., and supplies the record material P of predetermined magnitude to imprint drum 5a.
[0037] The separation means 9 has separation electrification machine 9a for separating the record material P after a toner image

imprint from imprint drum 5a, separation pawl 9b, 9-at separation Oshiage ** time c, etc.
[0038] A fixing assembly 10 is arranged under fixing roller 10a which has a heater inside, and the fixing roller 10a, and has application-of-pressure roller 10b which forces the record material P on fixing roller 10a.
[0039] A delivery unit 11 has conveyance pass change guide 11a arranged at the downstream of a fixing assembly 10, blowdown roller 11b, paper output tray 11c, etc. Moreover, the conveyance rollers 11h and 11i, reversal roller 11j, etc. are arranged at conveyance length pass 11d [for performing image formation to the lower part of conveyance pass change guide 11a to the both sides to the record material P of one sheet], reversal pass 11e, 11f [of loading members], and medium tray 11g, and a pan.
[0040] Moreover, potential sensor S1 which detects the electrification potential on the front face of a photoconductor drum between the primary electrification machines 2 and developers 4 in photoconductor drum 1 perimeter Moreover, concentration sensor S2 which detects the concentration of the toner image on a photoconductor drum 1 between a developer 4 and imprint drum 5a It is arranged, respectively.
[0041] It continues and the reader section II is explained. The reader section II arranged above the printer section I has full color sensor 12e which forms a color color-separation picture signal based on the light from lens 12d which condenses manuscript base glass 12a which lays Manuscript D, exposure lamp which carries out the exposure scan of image side of Manuscript D while moving 12b, two or more mirror 12c in which the reflected light from Manuscript D is reflected further, and the reflected light, and lens 12d. a color color-separation picture signal should pass an amplifying circuit (un-illustrating) -- it is processed by the video-processing unit (un-illustrating), and is sent out to the above-mentioned printer section I.
[0042] Next, actuation of the image formation equipment of the above-mentioned configuration is explained briefly, adding some configuration. In addition, in the following explanation, a full color image shall be formed four colors in order of yellow, cyanogen, a Magenta, and black.
[0043] The color is irradiated and separated by exposure lamp 12b, and first, the image of yellow is read by full color sensor 12e, and predetermined processing is performed to the image of the manuscript D laid in manuscript base glass 12a of the reader section II, and it is sent to the printer section I as a picture signal.
[0044] In the printer section I, revolution actuation of the photoconductor drum 1 is carried out in the arrow-head R1 direction, and a front face is charged in homogeneity with the primary electrification vessel 2. Based on the picture signal sent from the above-mentioned reader section II, a laser beam is irradiated from the laser output section of the exposure means 3, and photoconductor drum 1 front face [finishing / electrification] is exposed according to a light figure E through polygon mirror 3a etc. In exposure of photoconductor drum 1 front face, a charge is removed and, thereby, as for a carrier beam part, the electrostatic latent image corresponding to yellow is formed. In a developer 4, development counter 4Y of yellow is arranged in a predetermined development location, and the other development counters 4C and 4M and 4Bk are evacuated from a development location. Development counter 4Y adheres to the toner of yellow, develops the electrostatic latent image on a photoconductor drum 1, and it turns into a toner image. The toner image of the yellow on this photoconductor drum 1 is imprinted by the record material P supported by imprint drum 5a. The record material P of the magnitude to which the record material P was suitable for the manuscript image is supplied to imprint drum 5a from predetermined sheet paper cassette 8a to predetermined timing through feed roller 8b, conveyance roller, and resist roller 8c etc. Thus, the supplied record material P is adsorbed so that it may coil around the front face of imprint drum 5a, and it rotates in the arrow-head R5 direction, and the toner image of the yellow on a photoconductor drum 1 is imprinted by imprint electrification machine 5b.
[0045] On the other hand, a surface residual toner is removed by the cleaning machine 6, further, an unnecessary charge is removed by the pre-exposure lamp 7, and the next image formation which begins from primary electrification is presented with the photoconductor drum 1 after a toner image imprint.
[0046] In the imprint of the toner image to the record material P on [the read of the manuscript image by the above reader section II to] imprint drum 5a, and a pan Each process which results in cleaning of a photoconductor drum 1 and electric discharge is similarly performed about other colors other than yellow, i.e., cyanogen, a Magenta, and black, and as the toner image of four colors laps with the imprint material P on imprint drum 5a, it is imprinted.
[0047] The imprint of the toner image of four colors is separated from imprint drum 5a by separation electrification machine 9a, separation pawl 9b, etc., and the carrier beam record material P is conveyed by the fixing assembly 10 where a non-established toner image is supported on a front face. Heating application of pressure is carried out, melting fixing of the surface toner image is carried out by imprint roller 10a of a fixing assembly 10, and application-of-pressure roller 10b, and they are fixed to the record material P. The record material P after fixation is discharged by blowdown roller 11b on paper output tray 11c. In addition, when forming an image in both sides of the record material P, once driving conveyance pass change guide 11a immediately and leading the record material P after fixing assembly 10 blowdown to reversal pass 11e through conveyance length pass 11d, the direction and the reverse sense which were sent into the head by carrying out are made to leave the back end at the time of being sent in by the inversion of reversal roller 11j, and it contains to Trey Nakama 11g. Then, after forming an image in another field according to an above-mentioned image formation process again, it discharges on paper output tray 11c.
[0048] In imprint drum 5a after separation of the record material P, in order to prevent scattering adhesion of the fine particles to record material support sheet 5g top, adhesion of the oil on the record material P, etc., fur brush 13a which counters mutually through record material support sheet 5g, backup brush 13b, and oil clearance roller 14a and backup brush 14b clean. In addition, such cleaning is performed before image formation or after image formation, and it carries out at any time at the time of jam (paper jam) generating.
[0049] Moreover, in this example, magnitude of the gap of Hazama of record material support sheet 5g and a photoconductor drum 1 is considered as the configuration which can be set as arbitration by operating an eccentric cam 15 to desired timing, and

operating cam follower 5h of imprint drum 5a and one. For example, if a charge is on imprint drum 5a, in order for this charge to act to a photoconductor drum 1, to cause electrification memory and to reduce image quality in next image formation, he is trying to detach spacing of imprint drum 5a and a photoconductor drum 1 at the time during standby of power-source OFF.
[0050] The photoconductor drum 1 used for below by this example is explained in full detail. When the creation approach of photo conductor 1b was explained to ** from **, the sand mill equipment using phi1mm glass bead distributed the conductive titanium oxide fine-particles 50 weight section covered with the tin oxide containing 10% of antimony oxide, the phenol resin 25 weight section, the methyl-cellosolve 20 weight section, the methanol 5 weight section, and the silicone oil (poly dimethylsiloxane polyoxyalkylene copolymer, number average molecular weight 3000) 0.002 weight section for 2 hours, and the coating for electric conduction was adjusted. On the aluminum cylinder (phi80mmx360) as base 1a, carried out dipping coating of the above-mentioned coating, it was made to dry for 30 minutes at 140 degrees C, and the conductive layer of 20 micrometers of thickness was formed.
[0051] Next, the liquid which dissolved the methoxymethyl-ized Nylon (number average molecular weight 32000) 30 weight section and the alcoholic fusibility copolymerization Nylon (number average molecular weight 29000) 10 weight section into the mixed solvent of the methanol 260 weight section and the butanol 40 weight section was applied with the dipping coater on the above-mentioned conductive layer, and the undercoating layer whose thickness after desiccation is 1 micrometer was prepared.
[0052] Next, the disazo pigment of the structure expression of drawing 7 (a) was diluted with the cyclohexanone / tetrahydrofuran mixed solvent after the sand mill [section / 4 weight sections, the BENZARU resin 2 weight section, and / tetrahydrofuran 40 weight] equipment using phi1mm glass bead distributed for 60 hours, and the coating for charge generating layers was adjusted.
[0053] This coating liquid was applied with the dipping coater on **** and an undercoating layer, and the charge generating layer whose membrane layer after desiccation is 0.1 micrometers was prepared.
[0054] Next, dissolved the charge transport material 10 weight section of the structure expression of drawing 7 (b), and the polycarbonate resin (number average molecular weight 25000) 10 weight section into the mixed solvent of the dichloromethane 20 weight section and the mono-chlorobenzene 40 weight section, carried out dipping coating of this liquid on the above-mentioned charge generating layer, it was made to dry for 60 minutes at 120 degrees C, and the charge transporting bed of 20 micrometers of thickness was formed.
[0055] Next, the acrylic monomer resin 4 weight section, the tin-oxide (first [an average of] particle size of 0.3 micrometers) 5 weight section, and the photopolymerization initiator 1 weight section were distributed in the solvent of the ethanol 30 weight section, and it dissolved, and dipping coating of this liquid was carried out on the above-mentioned charge transporting bed, and it was irradiated for 30 seconds with the metal halide lamp (illuminance in the sensor which has main sensibility in 560 mW/cm2:360nm). This formed the surface protective layer of 3 micrometers of thickness.
[0056] In addition, when the photo conductor formed according to each above process is used as a photo conductor I, a photo conductor II - a photo conductor VI are shown below as other photo conductors.
[0057] the inside of the surface protective layer of the Photo conductor II:photo conductor I -- a tin-oxide particle (first [an average of] particle size of 0.3 micrometers) -- 1 weight **** rare ****** -- things -- except is taken as the same conditions as a photo conductor I.
[0058] photo conductor III : the acrylic monomer resin in the surface protective layer of a photo conductor I -- replacing with -- an epoxy resin -- using it -- this -- 10 weight **** rare ****** -- things -- except was taken as the same conditions as a photo conductor I.
[0059] Photo conductor IV: The conductive layer, the undercoating layer, the charge generating layer, and the charge transporting bed were formed on the aluminum cylinder like the photo conductor I. Next, the polycarbonate resin (number average molecular weight 25000) 6 weight section, the above-mentioned charge transport material 3 weight section, and the polytetrafluoroethylene (first [an average of] particle size of 0.3 micrometers) 1 weight section were dissolved into the mixed solvent of the dichloromethane 200 weight section and the mono-chlorobenzene 300 weight section, and spray coating of this liquid was carried out on the above-mentioned charge transporting bed, and it was made to dry for 60 minutes at 120 degrees C, and considered as the same conditions as a photo conductor I except having formed the surface protective layer of 5 micrometers of thickness.
[0060] Photo conductor V: There is no surface protective layer of a photo conductor IV, and it considered as the same conditions as a photo conductor IV except the polytetrafluoroethylene particle (first [an average of] particle size of 0.3 micrometers) being contained 10% in a charge transporting bed.
[0061] Photo conductor VI: It considered as the same conditions as a photo conductor IV except the first [an average of] particle size of the polytetrafluoroethylene particle in the surface protective layer of a photo conductor IV being 0.1 micrometers.

[0062] Next, according to the description of the record material P, a concrete numeric value is raised and explained about the control which changes the bearer rate (fixation bearer rate) of the record material P in a fixing assembly 10, and changes the image formation conditions of a photoconductor drum 1 further. In addition, the above-mentioned photo conductor I was used as photo conductor 1b of a photoconductor drum 1.
[0063] Relation with the fixation bearer rate and process speed which drawing 8 is made to correspond to the description and description of the record material P, and are set as it is shown.
[0064] The process speed shown in this drawing is equal to the bearer rate of the peripheral velocity of photoconductor drum 1 front face and the peripheral velocity of an imprint drum 5a front face, and the according to imprint drum 5a further record

material P as mentioned above. Moreover, they are standard paper of the 1st side 130 mm/sec, standard paper of the 2nd side 120 mm/sec, cardboard 100 mm/sec, and OHP sheet 30 mm/sec about a fixation bearer rate. Any fixation bearer rate is late set up a little rather than process speed. This is for hauling to the record material P not to produce a head [of one sheet / of the record material P], and back end side in within the limits of the tolerance of a fixation bearer rate and process speed, when each is conveyed simultaneous at a fixing assembly 10 and imprint drum 5a.

[0065] In addition, the description of the record material P forms the sensor which detects the thickness of for example, the record material P, the sensor which detects the translucency of the record material P in the body of image formation equipment, and judges the description of the record material P from the output of these sensors, and he is trying to change the image formation conditions of a photoconductor drum 1 into a fixation bearer rate and a pan based on the decision result. Moreover, about 1 side at the time of the double-sided image formation of the record material P, or 2 sides, in case a user operates the control panel on the body of image formation equipment (un-illustrating), it shall judge by whether double-sided image formation was chosen.

[0066] The fixation bearer rate shown in drawing 8 is an example, and is not limited to this. For example, in cardboard, if it bases and sets it as the actual condition to make a fixation bearer rate late etc., it is sufficient, so that the thickness is thick.

[0067] The timing chart at the time of performing full color image formation to drawing 2 continuously to two or more sheets of standard papers in standard slip side (1 side) mode is shown. This timing chart is illustrating the revolution of a photoconductor drum 1 as a base unit. As shown in this drawing, in standard slip side mode, they are **130 mm/sec and process speed about a fixation bearer rate **133 mm/sec It sets up, and these suppose that it is fixed until image formation finishes with the last standard paper.

[0068] Unlike above-mentioned standard slip side mode, in the cardboard mode shown in drawing 3 , a fixation bearer rate and process speed are made late at the time of fixation. Magenta latent-image formation and imprint M-1 are first performed to the 1st cardboard. It continues and same latent-image formation and imprint are performed one by one also about cyanogen C-1, yellow Y-1, and Black Bk. Thereby, the record material P on imprint drum 5a receives, and as the toner image of four colors laps, it imprints. until it begins from latent-image formation of this Magenta and the imprint of black finishes -- **133 mm/sec as above-mentioned standard slip side mode with the same process speed it is . in order that the fixation bearer rate in cardboard mode may supply sufficient heating value for cardboard -- a standard slip side -- **130 mm/sec it was -- a thing -- receiving -- **100 mm/sec It drops. the same -- process speed -- **133 mm/sec from -- **103 mm/sec It drops. That is, after the imprint of the toner image of Black Bk, the process speed of a photoconductor drum 1 is first reduced according to the fixation bearer rate of a fixing assembly 10, without separating cardboard from imprint drum 5a immediately, this reduces the process speed of the imprint drum 5 currently interlocked with the photoconductor drum 1, and it doubles with a fixation bearer rate. Then, with the separation means 9, it dissociates from imprint drum 5a, and cardboard is conveyed towards a fixing assembly 10.

[0069] Thus, good fixation can be performed by making a fixation bearer rate late according to cardboard (description of the record material P), and giving sufficient heating value for the welding of a toner image to cardboard. Furthermore, since both bearer rate to cardboard is almost the same even when the head side of cardboard is conveyed by the fixing assembly 10 and a back end side is simultaneously conveyed by imprint drum 5a Since neither curl nor a loop formation is formed in the pars intermedia of cardboard, it is not necessary to set up the distance of Hazama of the separation means 9 and a fixing assembly 10 for a long time than the conveyance direction die length of cardboard. It becomes unnecessary moreover, to secure from imprint drum 5a the excessive space which took formation of a loop formation etc. into consideration above the cardboard at the time of being conveyed by the fixing assembly 10. Therefore, the distance of Hazama of the separation means 9 and a fixing assembly 10 is shortened, and it becomes possible to eliminate the excessive space of the cardboard upper part further, and to miniaturize the whole image formation equipment.

[0070] Next, with reference to drawing 4 and drawing 5 , modification of the image formation conditions of the photoconductor drum 1 at the time of changing process speed according to the fixation bearer rate of a fixing assembly 10 is explained. In the following explanation, the grid bias electrical potential difference in the primary electrification machine 2 is changed as modification of image formation conditions.

[0071] it is shown in drawing 4 -- as -- process speed -- **133 mm/sec from -- **103 mm/sec If the signal (process speed down signal) changed in the direction to drop is inputted The revolution of a photoconductor drum 1 is stabilized and process speed is **103 mm/sec. By the time it converges If it has the time amount of t1 (300 - 1000msec) and electrification of a constant rate with the primary electrification machine 2 is continued regardless of rate change of a photoconductor drum 1 in the meantime, a transient overshoot and undershoot will occur on a photoconductor drum 1 with rate change of a photoconductor drum 1.

[0072] The relation between the process speed of a photoconductor drum 1 and the surface potential Vd of dark space is shown in drawing 5 . The inside Vg1 of this drawing, and Vg2 The grid bias electrical potential difference impressed to grid 2c (refer to drawing 1) of the primary electrification machine 2, respectively is shown. Surface potential Vd has the upper limit surface potential VdH (about [The OPC photo conductor of this example -800] V) with properties, such as pressure-proofing of a photoconductor drum 1, and has the minimum surface potential VdL (about [Similarly -400] V) with properties, such as pressure-proofing to the antipole nature charge of a photoconductor drum 1. It is in both medium and the surface potential at the time of image formation is VdM about this. It is shown. a grid bias electrical potential difference -- Vg1 the process speed of a photoconductor drum 1 -- **133 mm/sec it is -- the time (it illustrates in an A point among this drawing) -- surface potential -- VdM it is -- if process speed is reduced to this condition -- surface potential Vd -- going up -- process speed ** -- upper limit surface potential VdH It will exceed. then, the signal which lowers a grid bias electrical potential difference after predetermined time from a process speed down signal in this example -- outputting -- the time amount t3 of drawing 4 -- by [after

(100-800msec extent)] -- (-- the response time t5 (50 - 100msec) of a grid bias electrical potential difference is also contained in this time amount t3. Vg1 of) and a grid bias electrical potential difference from -- Vg2 Modification is ended. By this modification, process speed is **103 mm/sec after time amount t1. If stabilized, the surface potential Vd at this time is VdM as a B point shows. It settles down. That is, it enables it only for the part to which process speed became slow to be able to make almost comparable the amount of electrification charges given to per unit area of photoconductor drum 1 front face by lowering a grid bias electrical potential difference, even when process speed differs, therefore to maintain surface potential Vd almost uniformly.

[0073] On the contrary, it is also the same as when speeding up process speed from ** to **, and is the minimum surface potential VdL at process speed (10) (however, process speed (10) is illustrated by ten with O in drawing 5 .). It will exceed. then, the signal (grid bias rise signal) which raises a grid bias electrical potential difference from a process speedup signal after predetermined time -- outputting -- time amount t4 of drawing 4 by -- Vg2 of (the response time t6 is included in time amount t4), and a grid bias electrical potential difference from -- Vg1 Modification is terminated. By this modification, it is time amount t2. It is VdM as the A point in this drawing shows surface potential Vd, when process speed is behind stabilized in **. It falls and wears and becomes Lycium chinense.

[0074] In addition, upper limit surface potential VdH And minimum surface potential VdL In the photo conductor of this example, although it is -800V and about -400V, respectively as mentioned above, it depends for these values on extent of the damage which a photo conductor receives depending on a photo conductor property. for example, the case where the damage of plus (forward) in a photo conductor is given under a high-humidity/temperature environment especially when the imprint when imprinting to the record material P on imprint drum 5a twists the toner image on a photoconductor drum 1 to a brush imprint -- it is -- minimum surface potential VdL about [as **** / same] -- it is set to -400V. On the other hand, in the case of a corona-transfer system, it becomes about -450V.

<Example 2> It is t1 from a process speed down signal and a process speedup signal, respectively for detecting change of the process speed of a photoconductor drum 1 in the above-mentioned example 1. Time amount and t2 Although it should change to a predetermined process speed after time amount progress, this invention is not restricted to this. For example, the revolution of the photoconductor drum 1 from which process speed changed with a process speed down signal or process speedup signals actually is directly detected with an encoder etc., and you may make it change image formation conditions based on this output. In this case, since dispersion in the revolution of the driving source of a photoconductor drum 1 etc. can be eliminated, process speed is detectable to accuracy.

<Example 3> In the example 1, as image formation conditions changed with modification of the fixation bearer rate in a fixing assembly 10, although modification of a grid bias electrical potential difference was explained, other image formation conditions can also be changed. That is, when the process speed of a photoconductor drum 1 is changed, image formation conditions are changed so that image formation of the same quality as modification before can be performed. As image formation conditions used as the object for modification, at the time of development, if it is in the developer of the method to which the magnetic brush which impressed development bias is contacted, specifically, the amount of pre-exposures of the development bias and the pre-exposure lamp 7 which are impressed at that time, the laser light exposure of the exposure means 3, the imprint current of imprint electrification machine 5b, etc. are raised to a photoconductor drum 1. It enables it to form the toner image and the toner image of this concentration with which these image formation conditions were suitably changed according to process speed, for example, it was formed before process speed modification.

<Example 4> An example of other image formation equipments which applied this invention to drawing 6 is shown. In this example, it replaced with the photoconductor drum 1 which is the image support of the image formation equipment of drawing 1 , and photo conductor belt 1A is adopted as image support. In addition, since the configuration of each part material around photo conductor belt 1A is the same as the configuration of each part material around [photoconductor drum 1] an example 1 almost, it attaches the same sign and omits the explanation.

[0075] According to this example, photo conductor belt 1A is the time amount t1 shown in drawing 4 since the inertia force by the revolution is small as compared with a photoconductor drum 1, t2, t3, and t4. Since it can be shortened and the deflection at the time of a revolution can be suppressed small, it is possible to raise the system of the control at the time of changing process speed.

[0076] In an above-mentioned example 1 thru/or an above-mentioned example 4, in order to perform good fixation to the record material P with the large heat capacity of cardboard, an OHP sheet, etc., the case where a fixation bearer rate was made late was explained, but this invention can be applied, not only this but when making a fixation bearer rate late by other reasons, for example, the reason environmental temperature is low, or making a fixation bearer rate quick reversely further. That is, when not asking how of a reason but changing a fixation bearer rate, generally this invention can be attached and can be applied widely.

[0077]

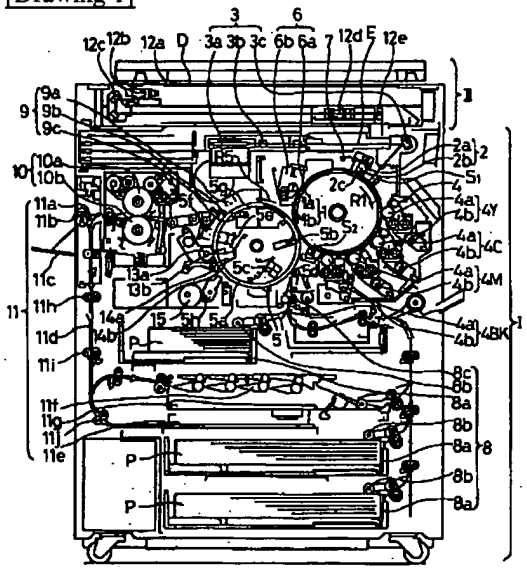
[Effect of the Invention] As explained above, while changing the record material bearer rate in a fixation means according to this invention Based on modification of the passing speed of the image support front face corresponding to modification of a record material bearer rate, by changing the image formation conditions in image support Always good fixation can be performed corresponding to change of the description of record material, without being accompanied by enlargement of image formation equipment, since the distance of a fixation means and image support can be set up short, without having an adverse effect on image support.

[Translation done.]

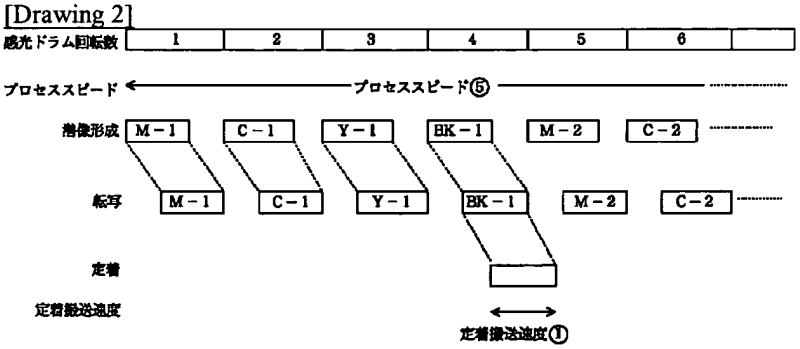
* NOTICES *

DRAWINGS

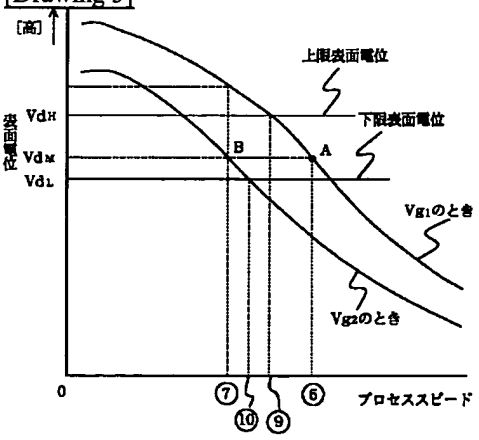
[Drawing 1]



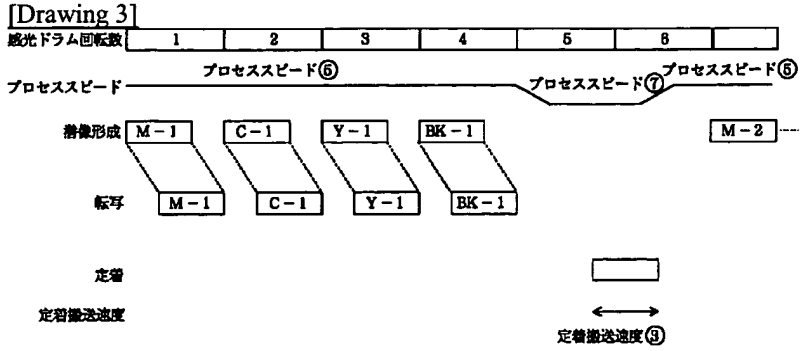
[Drawing 2]



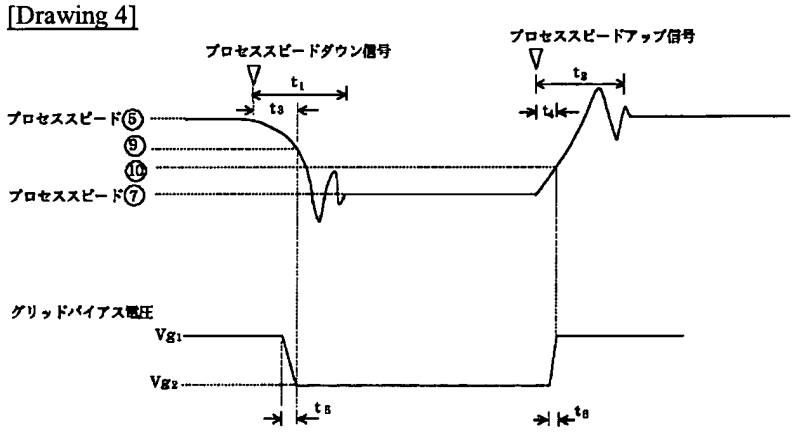
[Drawing 5]



[Drawing 3]



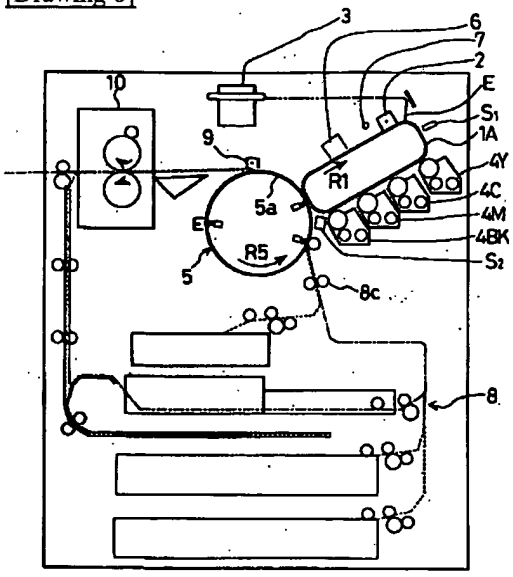
[Drawing 4]



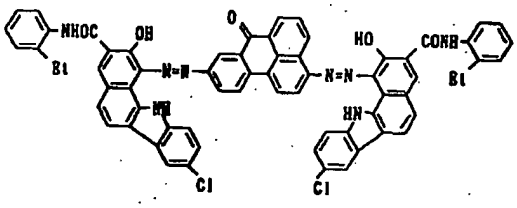
[Drawing 8]

記録材の性状	定着搬送速度 (mm/sec)	プロセススピード (mm/sec)
標準紙1面目	① 130	⑤ 133
標準紙2面目	② 120	⑥ 123
厚紙	③ 100	⑦ 103
OHPシート	④ 30	⑧ 33

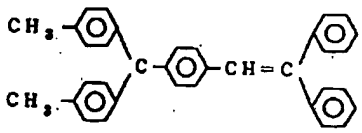
[Drawing 6]



[Drawing 7]

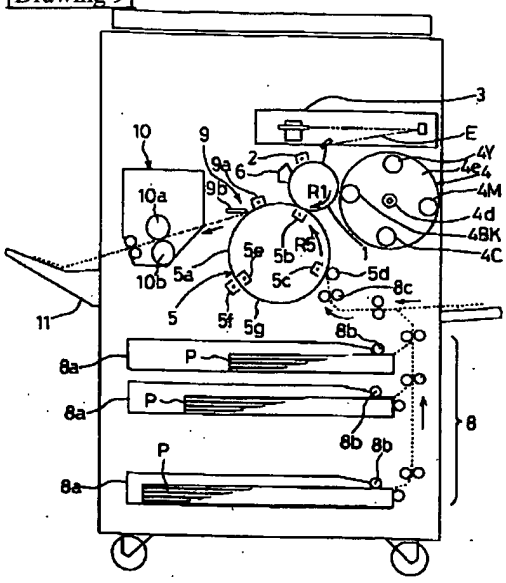


(a)



(b)

[Drawing 9]



[Translation done.]